ITS Linux Team Report

Members

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Background

On April 16, 2004, the ITS Director (David Fletcher) established a cross-functional team. The purpose of this team was to look at several Linux issues and make recommendations to enable ITS to move forward with Linux, work with our customers in a standardized approach, and understand what Linux can do that extends across the division. Specifically the team was charged to make recommendations on the following issues.

> Standards
> Direction
> Coordination
> Services
> R&D
> Security
> Resources
> Training
> Support (added by the Team)

Purpose

The purpose of this document is to identify the discussed issues and to provide management with the recommendations of the Linux Team. Each of the above issues will be addressed as follows.

Issues

Standards

There are dozens of Linux distributions available on the Internet. Many of these have been downloaded and installed on test equipment by various individuals. The market for Linux continues to evolve. Until several months ago, the main Linux OS used by ITS was Red Hat. With Novell's recent acquisition of SuSE, and the State's premium customer status with Novell, it seems inevitable that SuSE will play a role in our organization.

Some time ago as Linux was being tested on the mainframe, both Red Hat and SuSE were installed. The SuSE distribution was more integrated as IBM had worked closely with SuSE to include some of their proprietary code. Though both OS's were successful, the Red Hat distribution took much more time and effort to install. The

mainframe has some unique capabilities. These include sharing file structures (such as ../sbin) among different OS instances, an obvious strength in I/O. Testing was done between Intel, mainframe, and RISC platforms. Dave Jeffs has the test results for those interested. (Our mainframe CPU's are NOT as fast as the server that we ran our benchmark on).

Recommendation - ITS will support Red Hat and SuSE.

Issues - Anyone needing a Linux server could choose between either of these products based on their specific requirements. Red Hat support is currently $1,500 per server for premium 24 X 7 support. SuSE support will be at no cost at the present time due to our account status with Novell. SuSE standard 24x7 support is available at the cost of $499 per server. No quote for premium service was available. When comparing SuSE standard support with Red Hat Standard support, Red Hat was $299.00 to SuSE's $499.00. SuSE has some nice admin features that Red Hat does not. The operations staff has experience and is trained in Red Hat. There are some long term concerns with what may happen with Novell support of SuSE - we don't want to go down that path to find out that Novell will change the support / product / costs / etc and put the State in a difficult position. Both products will tend to implement new features at various times - hence they will likely leap over each other as new features are added. SuSE is a founding partner in United Linux where several different vendors will ship a common distribution of the Linux OS. Red Hat as a company has a greater market capitalization than Novell (4.38B vs. 3.97B). Red Hat is providing a free version of Linux under the Fedora project, though it appears this may not be ready for production servers as it is still in official test mode.

Direction

The current version of Red Hat is Red Hat Enterprise Linux 3.x. The current version of SuSE is Standard Server 8.x and SuSE 9.1 Professional.

Recommendation - Server installs will utilize Red Hat Enterprise 2.x or SuSE Standard Server 8.x. Desktop installations will utilize SuSE 9.1 Professional. Where possible ITS servers and desktops should be migrated from proprietary OS implementations to Linux.

Issues - Versions of software are constantly changing. The intent of supporting Linux is to keep current on software. Therefore these versions will change as new releases become available.

During the course of the meetings, the following were identified as on-going Linux related initiatives.

> Server consolidation with VMWare - headed by Norm Johnson
> Mainframe Linux - headed by Dave Jeffs
> Novell (GroupWise project) - headed by Curtis Parker
> LAMJ / LAMP - mostly complete - headed by Norm Johnson
> AGRC - adopted Linux for their ArcGIS project - headed by Mike Foulger, Matt Peters, and Barry Beidiger. Gabe Hammond installed the OS.
> Linux desktop strategy - headed by Tracy Goble
> eGuide - headed by Darrus McBride
> Customer requests (such as a PHP web site) - headed by ?
> sendmail server - headed by Eva Cornish
> Oracle on Linux - headed by Gerry Satterlee
> project to identify the next version of hosting - headed up by ?
> IDS - security project - headed up by ?

Recommendation - A single group within ITS should be assigned to review all aspects of Linux to eliminate duplication. Since Jack Pferdner is the product manager for hosting, he maybe the appropriate person to head up this group. In a recent survey sent out by Jack to our agencies, they indicated they would like to be a part of a group that headed up the direction of an open source Linux environment.

Issues - ITS has many different initiatives being headed up by different groups and individuals within the organization. Duplicated effort, loss of resource availability due to duplication of effort, and a lack of coordination and acceptance of a particular standard could be difficult to monitor.

Services

There are many different software packages available for installation in a Linux environment. Each of these can be installed through an RPM package or as a source download / compile option.

Recommendation - A base server installation will consist of the following via an RPM installation process for both Red Hat and SuSE.

Base OS Install
kernel, KDE, Gnome, networking, config tools, etc
ssh

vnc (could be a security issue)
security (firewall - iptables, tcp wrappers)
auditing tools (report on CPU, disk, etc)
snmp (does anyone monitor new servers?)
OS updater
ntp
backup sw (Norm suggested TSM - no cost to install - only when used)
sendmail
comilers (C, C++, fortran)

Based on the server requirements, the following optional components will be installed via an RPM installation process.

Optional Components
ftp
support tools to compile options (bison, cursors, etc)
mysql
apache
php
java
tomcat
jboss or some other J2EE container
samba (probably a base install on non production servers)

Issues - RPM installations are the recommended approach to adding new software. They typically have tight integration with the OS and other software packages. There may be a need to download / compile / install source code for some specific purposes. Other software can be installed based on the server requirements.

FTP - SuSE Standard Server 8.x ships with two FTP packages, vsftpd and PureFTPd. The recommendation is to support both versions based on the requirements for the server. The following guidelines can be used:
- ?? vsftpd would be recommended for server management when
    - o no TLS support is required and
    - o for simple web application transfers for HTML based web sites.
- ?? PureFTPd would be recommended when
    - o anonymous ftp is required,
    - o where multiple customers will be accessing the service,
    - o where support for database and TLS is required or
    - o where users need to use FTP and do not have an OS account on the server.

R&D

As with any new software installation there are many options. Questions arise and there are diverse ideas on how to install, maintain, and support the various possible configurations. It is imperative that as many options as possible are explored and evaluated to provide the best information to decision makers thus allowing them the ability to make informed choices.

Recommendation - Maintain the Linux lab Dave Jeffs currently heads up. Incorporate agency interest in our Linux lab. Any Linux questions should be directed to Dave. He can research the options in a controlled environment and provide recommendations or suggestions.

Issues - Depending on the tasks assigned to the lab, Dave may require the assistance of subject matter experts to assist with the analysis and configuration issues. All groups involved in any way with Linux should participate in the lab so consistent approaches can be developed for analysis, design, architecture, documentation and dissemination of information to avoid duplicate efforts.

Security

A key issue to the implementation of Linux is security. Linux seems far less prone to security problems when compared to a Microsoft-provided OS. It is less susceptible to viruses, buffer overruns, and the other major security problems that have plagued the Windows-based operating systems. Vigilance is still the key to a successful system. The work of the Linux team was reviewed by John (a member of the security group) to verify that we have addressed critical security issues. His suggestions and recommendations have been implemented as appropriate.

Recommendation - The standard installation documentation contains the minimum level of system security. As new servers come on line they should have their own specific security requirements.

Issues - Configurations of the operating system that go beyond the recommended installation document should be evaluated either in the Linux lab or by a member of the security group to verify acceptable precautions are being taken to protect the system from security violations. As time permits, the standard install document can be enhanced to address issues such as user, group, directory, running processes, and application-specific security.

Resources

Perhaps the best resource available to individuals in ITS is the Linux lab. Anyone involved in Linux can arrange to utilize an available machine and pretty much do what ever they would like to explore Linux as a solution. Within ITS there are several people who have experience with Linux. These individuals are identified in the training section of this document.

Recommendation - Provide general access to the Linux lab for both ITS and external customer agencies. Dave Jeffs must coordinate the work involved in the lab, and provide appropriate resources to anyone wishing to explore a Linux solution.

Issues - Another possible future solution is to use VMWare. A virtual machine could be quickly created with a standard configuration. Any questions or problems could be investigated in this environment without affecting other users of the system. This option may be a good approach for offsite individuals. ITS could maintain a standard virtual machine configuration for testing and R&D work.

Training

The following ITS individuals were identified as having done various levels of work with Linux: Gabe Hammond, Ellis Wood, Mike Miner, John Kane, Dick Hill, John Malouf, Rick Gee, Tracy Goble, Curtis Parker, Gilbert Jorgensen, Dale Hicks, Dave Jeffs, and Joe Leary. Gabe, Ellis, and Curtis have attended formal Linux training classes.

Recommendation - Those individuals directly responsible for Linux-based machines should be afforded the opportunity to attend Linux training tailored for their unique involvement.

Issues - Formal training does involve spending money. During these tight budget times, it is difficult to get these funds approved. There are some nice tutorials available on the internet. Purchasing Linux books is another great way to expand a person's knowledge. These and other options should be explored for individuals who have Linux responsibilities.

Support

Support for Linux can be viewed in two separate ways, servers and desktops. Each of these areas has their own set of support criteria. Servers by their very nature require 24 X 7 support. Desktops require a less critical level of support.

Recommendation - ITS production servers will have 24 X 7 maintenance and support. Operations will provide this support. They will be given the necessary access credentials to contact the OS venders directly to obtain the necessary support. Other systems and desktop support will be handled on a case-by-case basis or subscribed to as part of the LAN group's desktop support option.

Issues - The owner of the server or the group supporting the application will pay for Red Hat maintenance. SuSE maintenance will be provided as part of the existing Novell maintenance contract. Novell will provide one or more PINs allowing ITS operations to contact them directly for OS related questions. An individual can also obtain maintenance upgrades directly from the Internet through various mirrors (of which the University of Utah is a complete mirror). The ITS LAN group can also support a desktop as part of their desktop service offering. It is up to the server or desktop owner to maintain their system to current levels through whichever means they select. Many different forums and newsgroups also exist for addressing questions and problems for either operating system. Anyone involved in support is encouraged to utilize these available resources.